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Diego Caviglia

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EXAMINER

PARK, JEONG S

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/531,188	Applicant(s) CAVIGLIA ET AL.	
	Examiner JEONG S. PARK	Art Unit 2454	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/11/2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 89-92,94-114 and 116-136 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 89-92,94-114 and 116-136 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/11/2009 has been entered.

Response to Arguments

2. Applicant's arguments filed 5/11/2009 have been fully considered but they are not persuasive.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 89-97, 111-119 and 133-136 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (hereinafter Andersson)(U.S. Pub. No. 2002/0004843 A1) in view of Kinoshita et al. (hereinafter Kinoshita)(U.S. Pub. No. 2002/0172149 A1).

Regarding claims 89 and 111, Andersson teaches as follows:

A data communications system (a system, device, and method for bypassing network changes in a communication network, see, e.g., abstract, lines 1-2), comprising:

A plurality of nodes (A, B, C and D in figure 1) and a plurality of links (connections between each node A, B, C and D in figure 1) for providing connections between the nodes (figure 1 shows an exemplary communication network used to bypass network failures, see, e.g., page 3, paragraph [0044], lines 1-5);

A subset of the links and the nodes (node A, B, and C and connections between each nodes) being operative for forming a worker path (primary path, 110 in figure 1) for carrying worker data through the communications system (see, e.g., page 3, paragraph [0044], lines 5-11);

A further subset of the links and the nodes (node A, D and C and connections between each nodes) being operative for forming a plurality of protection paths (recovery path, 112 in figure 1) for carrying non-worker data in the absence of a fault in the worker path, and each being operative for providing an alternative path for the worker data in a different part of the worker path in the event of the fault in the worker path (the recovery path is available in the event of a network change in order to bypass the network change, see, e.g., page 2, paragraph [0021], lines 3-6 and the network change includes link failures, node failures and route changes, see, e.g., page 3, paragraph [0042], lines 3-5);

Protection means, in which the alternative paths (recovery paths) are predetermined by the protection means prior to detection of the fault in the worker path

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(primary path)(the recovery paths are pre-computed so as to circumvent potential failure points in the network, and are only activated in the event of a network failure, see, e.g., page 5, paragraph [0063], lines 3-10), the protection means being operative for activating the entire plurality of protection paths (recovery paths) to carry the worker data upon detection of the fault in the worker path (primary path)(the logic switches communications from the primary path to a recovery path in order to bypass the network failure, 510 in figure 5, see, e.g., page 4, paragraph [0057], lines 8-10), and the protection means being further operative for identifying the location of the fault (the detecting node signals the other nodes when the failure is detected so by signaling the failure between nodes it identifies the location of the fault, see, e.g., page 7, paragraph [0097] and [0098]), for returning the worker data to those parts of the worker path not affected by the fault (the network nodes switch certain communications to recovery paths while communication unaffected by the network failure remain on the primary paths, see, e.g., page 3, paragraph [0048], lines 3-8); and

Deactivating the recovery paths by activating the new set of primary path (computing the new set of primary paths based upon the topology information and activating the new set of primary paths in order to override the temporary switch over to the recovery paths, see, e.g., page 4, paragraph [0053]).

Andersson does not teach a plurality of disjoint detours which each providing an alternative path for the worker data in a different part of the worker path, deactivating before the fault is repaired any of the protection paths for providing an alternative to

those parts of the worker path not affected by the fault, nor messages activating the protection path are sent from both the beginning and the end of each detour.

Kinoshita teaches as follows:

A subset of the plurality of links (links connection between nodes A to J in figure 1) and the plurality of nodes (nodes A to J, in figure 1) being operative for forming a protection path for carrying non-worker data in the absence of a fault in the worker path (when setting up a working path, a protection path is automatically set up by taking each node on the working path as a start point, see, e.g., abstract), the protection path comprising a plurality of disjoint detours (40, 42, 44 and 46 in figure 8, see, e.g., page 4, paragraph [0071]), each detour being operative for providing an alternative path for the worker data in a different part of the worker path in the event of a fault in the worker path (each node determines a protection path route by setting itself as the start-point node for restoring node failure at their adjacent nodes on the working path and link failures on both sides of these adjacent nodes, see, e.g., page 3, paragraph [0068]);

The protection means being further operative for identifying the location of the fault, and for returning the worker data to a part of the worker path not affected by the fault from at least one of the plurality of detours providing an alternative to that part of the worker path not affected by the fault, while those of the plurality of detours providing an alternative to parts of the worker path which are affected by the fault continue to carry the worker data (local repair protection paths for restoring node or link failures on

the working path teaches local detouring per node or link failures for the restoration purpose, see, e.g., page 3, paragraph [0066]);

Deactivating (protection path setup/release control section 66 in figure 19 in each node) before the fault is repaired any of the protection paths for providing an alternative to those parts of the worker path not affected by the fault (the route determining section determines the optimum route to the PML by excluding any node or link to be bypassed, see, e.g., page 7, paragraph [0126]). Therefore each node (protection path setup/release control section 66 in figure 19 in each node) can release the determined protection path locally while the other protection paths for the other node failure are still active; and

Messages activating the protection path are sent from both the beginning and the end of each detour (protection path setup/release control section, 66 in figure 19, requests the signaling control section to send out a protection path setup request message and performs the same process at each node along the protection path route, see, e.g., page 7, paragraph [0126]).

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine Andersson with Kinoshita to include setting up a local repair protection paths as taught by Kinoshita in order to locally and efficiently restore node or link failures on the working path.

Regarding claims 90 and 112, Andersson teaches as follows:

The nodes of the further subset comprise storage (forwarding table, 200 in figure 2) for storing details of the protection paths (recovery paths, 220 in figure 2) prior to the

detection of the fault in the worker path (the recovery paths are installed in the forwarding table at each relevant router so that the recovery paths are available in the event of a network change, see, e.g., page 2, paragraph [0021], lines 3-6).

Regarding claims 91 and 113, Andersson teaches as follows:

The details of the protection path (recovery paths, 220 in figure 2) are associated with a unique path identifier (marker, 206 in figure 2)(the forwarding table, 200 in figure 2, identifies the recovery path by mapping the outgoing interface I_D with destination node C, see, e.g., page 3, paragraph [0047], lines 1-9).

Regarding claims 92 and 114, Andersson teaches as follows:

Each of the nodes of the further subset comprise a protection table (forwarding table, 200 in figure 2) for storing the details of the protection path to which it belongs (the recovery paths are installed in the forwarding table at each relevant router so that the recovery paths are available in the event of a network change, see, e.g., page 2, paragraph [0021], lines 3-6).

Regarding claims 94 and 116, Andersson teaches as follows:

The nodes comprising means for sending the activate message (signaling the failure) also comprise means for sending the activate message to each adjacent node of the further subset (the detecting node signals the other nodes when the failure is detected and the signaling is a simple sub-routine call in order to initiate the switch over to the recovery paths, see, e.g., page 7, paragraph [0098], lines 1-6).

Regarding claims 95 and 117, Andersson teaches as follows:

The activate message contains a unique path identifier (marker, 206 in figure 2) to inform the nodes of the further subset which connections to activate (the detecting node identifies the nodes of the recovery path by marker, 206 in figure 2, see, e.g., page 3, paragraph [0046]).

Andersson does not teach of defining a cross-connection in the path that transfers traffic from the worker path to the detour.

Kinoshita teaches as follows:

Determining the optimum protection path route bypassing a node failed (see, e.g., page 6, paragraph [0119]-[0127]). Therefore the optimum protection path route defines a cross-connection between existing primary path and the protection path.

Therefore they are rejected for similar reason as presented above in claims 89 and 111.

Regarding claims 96 and 118, Andersson teaches as follows:

The nodes comprise means for detecting the location of the fault in the worker path and means for, upon detection of the fault location, sending a deactivate message (signaling the failure) through the first-mentioned subset in a direction away from the fault (removing and blocking the primary path from the forwarding table see, e.g., page 3, paragraph [0048], lines 8-12 and the detecting node signals the other nodes when the failure is detected, see, e.g., page 7, paragraph [0098], lines 1-6).

Regarding claims 97 and 119, Andersson teaches as follows:

Each node comprises means for detecting receipt of the deactivate message and, upon receipt of such a message (the detecting node signals the other nodes when

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the failure is detected and the signaling is a simple sub-routine call in order to initiate the switch over to the recovery paths, see, e.g., page 7, paragraph [0098], lines 1-6), for deactivating any path (removing and blocking the primary path) passing from that node via nodes of the further subset where those paths do not form a protection path to a faulty part of the worker path (removing and blocking the primary path from the forwarding table see, e.g., page 3, paragraph [0048], lines 8-12 and the detecting node signals the other nodes when the failure is detected, see, e.g., page 7, paragraph [0098], lines 1-6).

Regarding claims 133 and 135, Andersson does not teach of a node or a link is allocated to several protection paths only if said protection paths are not activated simultaneously by a single fault.

Kinoshita teaches as follows:

A node (node G in figure 8) or a link is allocated to several protection paths (protection paths 40 and 42) and only if said protection paths are not activated simultaneously by a single fault (bandwidth sharing projection paths, see, e.g., page 4, paragraph [0071]-[0073] and figure 8).

Therefore they are rejected for similar reason as presented above in claims 89 and 111.

Regarding claims 134 and 136, Andersson does not teach of only a node terminating a detour is adapted to inactivate the detour if said detour is unused.

Kinoshita teaches as follows:

A node terminating a detour is adapted to inactivate the detour if said detour is unused (the protection path release instruction issues an instruction to release resources, see, e.g., page 5, paragraph [0102]).

Therefore they are rejected for similar reason as presented above in claims 89 and 111.

5. Claims 98-110 and 120-132 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andersson et al. (hereinafter Andersson)(U.S. Pub. No. 2002/0004843 A1) in view of Kinoshita et al. (hereinafter Kinoshita)(U.S. Pub. No. 2002/0172149 A1) and further in view of Peterson et al. (hereinafter Peterson)(Computer Networks a Systems Approach Section 4.2.2 by Larry L. Peterson et al., 2dn edition, pages 284-292, published by Morgan Kaufmann Publishers, October 1999).

Regarding claims 98 and 120, Andersson teaches as follows:

Allocating the links and the nodes at least one cost value (routing information) relative to the links and the nodes of the worker path (primary path)(the network nodes exchange routing information as part of a routing protocol such as distance-vector protocols and link-state protocols, wherein the allocating the routing information for each nodes and links is inherent, see, e.g., page 5, paragraph [0061], lines 1-7), and means for selecting on the basis of the at least one cost value (routing information) a further subset of the nodes and the links to form a protection path (recovery path) for at least one of the links and the nodes of the worker path (each network node determines the

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primary and recovery paths from the routing information, see, e.g., page 5, paragraph [0061], lines 8-15 and see, e.g., page 5, paragraph [0063], lines 1-3 for computing recovery paths).

Anderson in view of Kinoshita do not teach details of the distance-vector protocols related to the allocating a cost value to the links and the nodes.

Peterson teaches as follows:

Each node constructs a one-dimensional array (a vector) containing the distances (costs) to all other nodes;

Each node distributes that vector to its immediate neighbors; and

Each node knows the cost of the link to each of its directly connected neighbors (see, e.g., page 284, lines 1-6).

It would have been obvious for one of ordinary skill in the art at the time of the invention to combine Andersson in view of Kinoshita with Peterson to include details of the distance-vector protocols related to the allocating a cost value to the links and the nodes, as taught by Peterson in order to select efficiently primary or recovery paths based on the distances (costs) among multiple paths.

Regarding claims 99 and 121, Andersson teaches as follows:

Selecting the subset that has the lowest cost value (selecting as the primary paths the shortest paths, which have the least hop counts, to each potential network destination, see, e.g., page 5, paragraph [0061], lines 8-10).

Regarding claims 100-102 and 122-124, Andersson teaches as follows:

Allocating the nodes and the links on the worker path (primary paths) other than the at least one of the nodes and the links to be protected (recovery paths) a cost value lower than the cost value for other nodes and links (the recovery paths are marked as non-preferred or lower priority paths compared to the primary paths, see, e.g., page 3, paragraph [0043], lines 9-12).

Regarding claims 103 and 125, Andersson teaches as follows:

A cost value for the at least one of the nodes and the links to be protected is set so that the at least one of the nodes and the links will not be selected (the recovery paths are marked as non-preferred or lower priority paths compared to the primary paths, and not the recovery paths are used for forwarding packets during normal operation, see, e.g., page 3, paragraph [0043], lines 9-12).

Regarding claims 104 and 126, Andersson teaches as follows:

Further subsets of the nodes and links, wherein the further subsets are interpreted as a plurality of primary or recovery paths, for forming both a further worker path and a protection path for the further worker path (each network node determines the primary and recovery paths from the routing information, see, e.g., page 5, paragraph [0061], lines 8-15 and see, e.g., page 5, paragraph [0063], lines 1-3 for computing recovery paths).

Regarding claims 61-63 and 83-85, Andersson teaches as follows:

The recovery paths are marked as non-preferred or lower priority paths compared to the primary paths, and not the recovery paths are used for forwarding packets during normal operation (see, e.g., page 3, paragraph [0043], lines 9-12).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Andersson to include marking the one of the recovery paths as an intermediate or higher cost value relative to the worker path in order to set the priority among multiple of primary or recovery paths.

Regarding claims 108 and 130, Andersson teaches as follows:

Allocating the links and the nodes a cost value (the network nodes exchange routing information as part of a routing protocol, wherein the allocating the routing information for each nodes and links is inherent, see, e.g., page 5, paragraph [0061], lines 1-7).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Andersson to allocate a cost value relative to each link and node of the worker path in order to set the priority among multiple of primary or recovery paths.

Regarding claims 109 and 131, Andersson teaches as follows:

Determining the protection path prior to the detection of the fault in the worker path (the recovery paths are pre-computed so as to circumvent potential failure points in the network, and are only activated in the event of a network failure, see, e.g., page 5, paragraph [0063], lines 3-10).

Regarding claims 110 and 132, Andersson teaches as follows:

Allocating the links and the nodes a further cost value relative to the further worker path (the network nodes exchange routing information as part of a routing protocol, wherein the allocating the routing information for each nodes and links is inherent, see, e.g., page 5, paragraph [0061], lines 1-7) and for selecting on the basis of the further cost value a further subset of the nodes and links to form the protection path for at least one of the links and the nodes of the further worker path (selecting as the primary paths the shortest paths, which have the least hop counts, to each potential network destination, see, e.g., page 5, paragraph [0061], lines 8-10).

It would have been obvious for one of ordinary skill in the art at the time of the invention to modify Andersson to allocate the links and the nodes a further cost value relative to the further worker path in order to set the priority among multiple of primary or recovery paths.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JEONG S. PARK whose telephone number is (571)270-1597. The examiner can normally be reached on Monday through Friday 7:00 - 3:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. S. P./
Examiner, Art Unit 2454

June 24, 2009
/Nathan J. Flynn/

Supervisory Patent Examiner, Art Unit 2454